SciAps ApNotes
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A Practical Comparison: FieldSpec 4 and reveNIR

Selecting the Right Field Spectrometer for Field and Laboratory Applications

Introduction

Field and portable spectrometers are used across mining, agriculture, environmental monitoring, and remote sensing. While FieldSpec™ 4 and reveNIR™ operate in similar spectral regions, they are designed for different measurement workflows.

FieldSpec 4 is optimized for applications requiring the highest spectral quality, flexible sampling geometries, and radiometrically calibrated measurements. It supports non-contact measurements and can use external illumination sources, including sunlight.

reveNIR is optimized for fast, handheld field use. It is designed for contact measurements and includes integrated tools for mineral matching and quantitative predictions directly in the field.

When to Use FieldSpec 4

FieldSpec 4 is best suited for applications requiring:

- maximum spectral quality and low noise
- non-contact measurement capability
- radiance and irradiance measurements
- use of sunlight as a light source
- flexible sampling through specialized accessories

Typical applications include remote sensing and validation studies, NDVI and vegetation analysis, ground truthing, environmental and water studies, and laboratory-based spectroscopy.

When to Use reveNIR

reveNIR is best suited for applications requiring:

- true handheld portability
- fast and simple field workflows
- mineral matching using built-in libraries
- in-field quantitative predictions
- integrated GPS, cameras, and cloud connectivity

Typical applications include mineral identification in mining, field-based quantitative analysis, and agricultural analysis of plants and soils.

Summary

FieldSpec 4 is the preferred solution when spectral quality, non-contact sampling, and radiometric capability are required.

reveNIR is the preferred solution when handheld operation, rapid field decisions, and mineral matching are the primary needs.

Overlapping Applications

Both instruments can be applied to food analysis, pharmaceutical and nutraceutical screening, in-situ soil analysis, plant physiology, grain and seed analysis, and raw material characterization.

In these cases, the primary selection factors are portability, workflow simplicity, and budget.

Feature	FieldSpec 4	ReveNIR
Wavelength Range	Spectral Range: 350-2500 nm	Spectral Range: 350-2500 nm
Spectral Resolution (Standard-Res)	3nm @ 700 nm 10 nm @ 1400 nm 10 nm @2100 nm	VNIR: 1.5 nm spectral average SWIR1 and SWIR2: ⩽8 nm spectral average
Wavelength Accuracy	±0.5 nm (average error of wavelength calibration fit; ±1.0 nm for any one line)	VNIR: 0.5 nm SWIR 1: 2.7 nm SWIR 2: 2.7 nm
VNIR detector	512 element silicon array (350-1000 nm)	CCD array – 2500 pixels (350-975 nm)
SWIR1 detector	InGaAs photodiode, TE cooled (1001-1800 nm)	Standard InGaAs – 256 pixels (976-1690 nm)
SWIR2 detector	InGaAs photodiode, TE cooled (1801-2500 nm)	Extended InGaAs – 256 pixels (1691 -2500 nm)
Signal to Noise Ratio	VNIR: 13000:1 SWIR 1 6900:1 SWIR 2: 2600:1	VNIR: 525:1 SWIR 1 1100:1 SWIR 2: 1300:1
Scanning Time	100 milliseconds	100 milliseconds